

Abstract for 42nd International Conference on Environmental Systems

Title: Advanced Spacesuit Portable Life Support System Oxygen Regulator Development and Testing

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Abstract:

The advanced spacesuit portable life support system (PLSS) oxygen regulators represent an evolutionary approach to regulator development. Several technology development prototypes have been produced that borrow much of the mechanical regulator design from the well proven Shuttle/ISS Extravehicular Mobility Unit (EMU) Secondary Oxygen Regulator, but incorporate a motor-settable pressure set-point feature that facilitates significantly greater operational flexibility. For example, this technology would enable EVA to begin at a higher suit pressure, which would reduce pre-breathe time, and then slowly step down to a lower pressure to increase suit mobility for the duration of the EVA. Comprehensive testing of the prototypes was performed on the component level as well as part of the PLSS 1.0 system level testing. Results from these tests characterize individual prototype performance and demonstrate successful operation during multiple nominal and contingency EVA modes.